

California Regional Water Quality Control Board, Los Angeles Region

**Malibu Creek Watershed – Malibu Creek
Total Selenium**

Summary of Proposed Action

Malibu Creek is proposed to be listed in the 2002 305(b) water quality assessment as partially supporting (impaired) due to greater than one exceedance of the total selenium chronic water quality criterion for protection of fresh water aquatic life. The beneficial uses that are affected by this impairment relate to aquatic life use support and include warm freshwater habitat, wildlife habitat, and rare/endangered species habitat.

Table 1. 303(d) Listing/TMDL Information

Waterbody Name	Malibu Creek	Pollutants/Stressors	Total Selenium
Hydrologic Unit	404.21	Source(s)	Nonpoint Sources
Total Waterbody Size	9.9	TMDL Priority	TMDL Analytical Unit 68
Size Affected	9.9	TMDL Start Date (Mo/Yr)	2006
Extent of Impairment	Malibu Creek to Malibu Lagoon	TMDL End Date (Mo/Yr)	2008

Watershed Characteristics

The Malibu Creek watershed is located about 35 miles west of Los Angeles, California. The watershed extends from the Santa Monica Mountains and adjacent Simi Hills to the Pacific coast at Santa Monica Bay, and drains an area of 109 square miles (Figure 3). The outlet of the watershed is Malibu Lagoon in the city of Malibu. Outflows from the watershed drain into Santa Monica Bay at Malibu Beach when the entrance to the lagoon is open to the ocean. However, coastal sediment transport processes typically form a sand barrier that blocks the entrance during the dry season. Malibu Lagoon accumulates all the watershed flows during these closed periods. Several creeks and lakes occur in the upper portions of the watershed, and these ultimately drain into Malibu Creek, which is the main stream in the downstream portion of the watershed. Malibu Creek drains into Malibu Lagoon.

Water Quality Objectives Not Attained

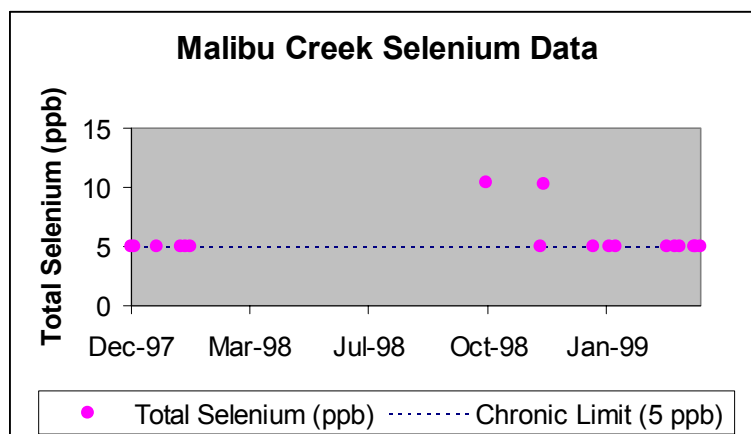
Through the California Toxic Rule, the United States Environmental Protection Agency promulgated water quality criteria to protect fresh water aquatic life. The recommended Criteria Continuous Concentration for total selenium is 5 µg/l. This criterion range was exceeded in 10% of the sampling events.

Beneficial Uses Affected

- non-contact water recreation
- contact recreation
- warm freshwater habitat
- cold freshwater habitat
- wildlife habitat
- migration of aquatic organisms
- spawn, reproduction, and/or early development
- rare/endangered species

Data Assessment

The chart below shows that during the 1998-1999 monitoring year the concentration of total selenium was exceeded during two monitoring events. The data analyzed in the charts was collected from a storm water monitoring program. During 1999-2000 monitoring year, the selenium concentrations in the storm water samples were below the 5.0 µg/l limit.



Summary Table for Total Selenium

	Total Selenium (µg/l)
Dates of Sampling	11/10/97- 11/10/99
Number of Samples (n)	21
Minimum Data Value	5
Maximum Data Value	10.4
Median Data Value	5
Arithmetic Mean Value	5.51
Standard Deviation	1.61
Percent above CCC	10

Potential Sources

Unknown

References

Basin Plan, 1994

Watershed Management Initiative, 2000

Los Angeles County 1994-2000 Integrated Receiving Water Impacts Report, July 2000

California Toxics Rule, August 2000

California Regional Water Quality Control Board, Los Angeles Region

**Malibu Creek Watershed – Cold Creek
Algae**

Summary of Proposed Action

Cold Creek is proposed to be listed in the 2002 305(b) water quality assessment as impaired due to observations of excessive algal growth (greater than 30 percent coverage). The beneficial uses that are affected by this impairment relate to recreational (non-contact and contact) and aquatic life use support.

Table 1. 303(d) Listing/TMDL Information

Waterbody Name	Cold Creek	Pollutants/Stressors	Algae
Hydrologic Unit	404.21	Source(s)	Nonpoint Sources
Total Waterbody Size	9.9	TMDL Priority	Analytical Unit 50
Size Affected	1.4	TMDL Start Date (Mo/Yr)	1999
Extent of Impairment	Coray Way to confluence with Malibu Creek	TMDL End Date (Mo/Yr)	May 2002

Watershed Characteristics

The Malibu Creek watershed is located about 35 miles west of Los Angeles, California. The watershed extends from the Santa Monica Mountains and adjacent Simi Hills to the Pacific coast at Santa Monica Bay, and drains an area of 109 square miles (Figure 3). The outlet of the watershed is Malibu Lagoon in the city of Malibu. Outflows from the watershed drain into Santa Monica Bay at Malibu Beach when the entrance to the lagoon is open to the ocean. However, coastal sediment transport processes typically form a sand barrier that blocks the entrance during the dry season. Malibu Lagoon accumulates all the watershed flows during these closed periods. Several creeks and lakes occur in the upper portions of the watershed, and these ultimately drain into Malibu Creek, which is the main stream in the downstream portion of the watershed. Malibu Creek drains into Malibu Lagoon.

Water Quality Objectives Not Attained

The Water Quality Control Plan for the Los Angeles Region (Basin Plan) states that, "Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses." In addition, the plan states, " Water shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses." A minimum of ten samples within a 3-year period was required to assess whether Cold Creek was supporting its beneficial uses. The narrative criterion of excessive nuisance algae is expressed as algal cover exceeding 30% based on Biggs, 2000. Impairment is defined as an exceedance of the criterion in at least 10% of the samples. The criterion is not specific to floating or bottom algae and so was used to evaluate both. Based on the assessment, Cold Creek exceeded the criteria in 10% of the observations.

Beneficial Uses Affected

- non-contact water recreation
- contact recreation
- warm freshwater habitat
- cold freshwater habitat
- wildlife habitat
- migration of aquatic organisms
- spawn, reproduction, and/or early development
- rare/endangered species

Data Assessment

Summary of Algae Data for Lower Cold Creek

	Algae Observations
Dates of Sampling	11/7/98- 4/7/01
Number of Samples (n)	43
Observation with > 30 coverage	8
Number (Percent) above Objective	19 %

Potential Sources

The data from the Heal the Bay monitoring location HTB3 (just above outlet to Malibu Creek) provided all of the impairment data points. This sampling location is downstream from rural residential homes with septic systems and horses, which are typical nutrient sources. The sampling site also has open areas, which have limited shading.

References

Basin Plan, 1994

Watershed Management Initiative, 2000

Biggs, B. J. F, 2000. New Zealand Periphyton Guideline: Detecting, monitoring, and managing enrichment of streams. New Zealand Ministry of the Environment. Page 91.

Draft 1/14/02

California Regional Water Quality Control Board, Los Angeles Region

Malibu Creek Watershed – Malibu Lagoon pH (high)

Summary of Proposed Action

Malibu Creek is proposed to be listed in the 2002 305(b) water quality assessment as "Not Supporting" (Impaired) due to pH exceedances of 8.5, which violates the Basin Plan water quality objective for pH.

Table 1. 303(d) Listing/TMDL Information

Waterbody Name	Malibu Lagoon	Pollutants/Stressors	pH (elevated)
Hydrologic Unit	404.21	Source(s)	Unknown Sources
Total Waterbody Size	9.9	TMDL Priority	71
Size Affected	13 acres	TMDL Start Date (Mo/Yr)	2007
Extent of Impairment	Malibu Lagoon	TMDL End Date (Mo/Yr)	2010

Watershed Characteristics

The Malibu Creek watershed is located about 35 miles west of Los Angeles, California. The watershed extends from the Santa Monica Mountains and adjacent Simi Hills to the Pacific coast at Santa Monica Bay, and drains an area of 109 square miles (Figure 3). The outlet of the watershed is Malibu Lagoon in the city of Malibu. Outflows from the watershed drain into Santa Monica Bay at Malibu Beach when the entrance to the lagoon is open to the ocean. However, coastal sediment transport processes typically form a sand barrier that blocks the entrance during the dry season. Malibu Lagoon accumulates all the watershed flows during these closed periods. Several creeks and lakes occur in the upper portions of the watershed, and these ultimately drain into Malibu Creek, which is the main stream in the downstream portion of the watershed. Malibu Creek drains into Malibu Lagoon.

Water Quality Objectives Not Attained

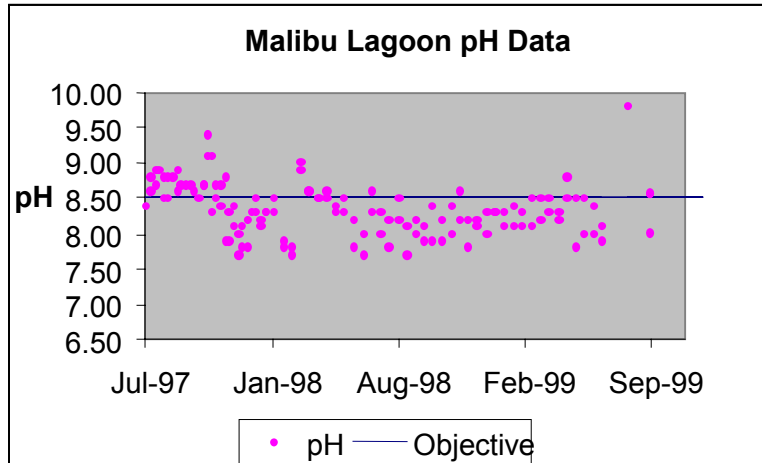
The Water Quality Control Plan for the Los Angeles Region (Basin Plan) states that, "The pH of bays or estuaries shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges." This objective was not attained in the estuary as indicated by the data assessment presented below.

Beneficial Uses Affected

- Basin Plan Objective
- Aquatic Life

Data Assessment

The chart below shows that during 1997-1999 the pH maximum of 8.5 was exceeded in 33 samples. The LARWQCB and the Tapia Water Reclamation Facility collected the data analyzed in the charts primarily during dry weather.



Summary Table for pH

	High pH value
Dates of Sampling	7/15/97- 11/29/99
Number of Samples (n)	138
Minimum Data Value	7.4
Maximum Data Value	9.79
Median Data Value	8.30
Arithmetic Mean Value	8.29
Standard Deviation	0.39
Percent above pH Objective (8.5)	24

Potential Sources

The sampling location for the pH data was at various monitoring stations within the lagoon. Several nonpoint sources discharge to the Lagoon, such as septic systems, storm drains, and birds.

References

- Basin Plan, 1994
- Watershed Management Initiative, 2000
- Los Angeles County 1994-2000 Integrated Receiving Water Impacts Report, July 2000

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California Regional Water Quality Control Board, Los Angeles Region

Malibu Creek Watershed – Malibu Creek Total Aluminum

Summary of Proposed Action

Malibu Creek is proposed to be listed in the 2002 305(b) water quality assessment as "Fully Supporting, but Threatened" (Impaired) due to exceedance of the total aluminum primary drinking water standard. The beneficial uses that are affected by this impairment is municipal and domestic drinking water supply.

Table 1. 303(d) Listing/TMDL Information

Waterbody Name	Malibu Creek	Pollutants/Stressors	Total Aluminum
Hydrologic Unit	404.21	Source(s)	Nonpoint Sources
Total Waterbody Size	9.9	TMDL Priority	68
Size Affected	9.9	TMDL Start Date (Mo/Yr)	2006
Extent of Impairment	Malibu Creek to Malibu Lagoon	TMDL End Date (Mo/Yr)	2008

Watershed Characteristics

The Malibu Creek watershed is located about 35 miles west of Los Angeles, California. The watershed extends from the Santa Monica Mountains and adjacent Simi Hills to the Pacific coast at Santa Monica Bay, and drains an area of 109 square miles (Figure 3). The outlet of the watershed is Malibu Lagoon in the city of Malibu. Outflows from the watershed drain into Santa Monica Bay at Malibu Beach when the entrance to the lagoon is open to the ocean. However, coastal sediment transport processes typically form a sand barrier that blocks the entrance during the dry season. Malibu Lagoon accumulates all the watershed flows during these closed periods. Several creeks and lakes occur in the upper portions of the watershed, and these ultimately drain into Malibu Creek, which is the main stream in the downstream portion of the watershed. Malibu Creek drains into Malibu Lagoon.

Water Quality Objectives Not Attained

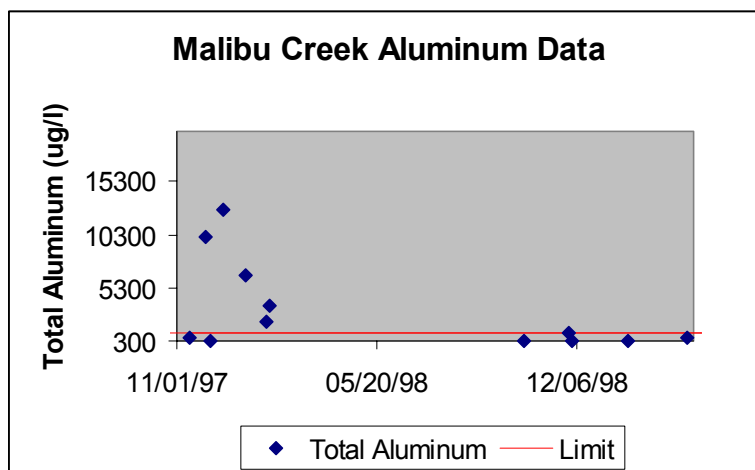
Through the Primary Drinking Water Standards, the United States Environmental Protection Agency promulgated water quality criteria to protect municipal and domestic drinking water supplies. The recommended total concentration for aluminum is 1000 ug/l. This criterion range was exceeded in 29% of the sampling events.

Beneficial Uses Affected

- Municipal and Domestic Supply

Data Assessment

The chart below shows that during 1997-1999 total aluminum was exceeded in six samples. The data analyzed in the charts was collected from a storm water monitoring program.



Summary Table for Total Aluminum

	Total Aluminum (µg/l)
Dates of Sampling	11/10/97- 11/10/99
Number of Samples (n)	21
Minimum Data Value	100
Maximum Data Value	43000
Median Data Value	331
Arithmetic Mean Value	3924
Standard Deviation	9613
Percent of samples above Limit	29

Potential Sources

Unknown

References

- Basin Plan, 1994
- Watershed Management Initiative, 2000
- Los Angeles County 1994-2000 Integrated Receiving Water Impacts Report, July 2000

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California Regional Water Quality Control Board, Los Angeles Region

Malibu Creek Watershed – Malibu Creek Nitrite as Nitrogen

Summary of Proposed Action

Malibu Creek is proposed to be listed in the 2002 305(b) water quality assessment as "Fully Supporting, but Threatened" (Impaired) due to exceedance of the nitrite as nitrogen primary drinking water standard. The beneficial use that is affected is municipal/domestic drinking water supply.

Table 1. 303(d) Listing/TMDL Information

Waterbody Name	Malibu Creek	Pollutants/Stressors	Nitrite as Nitrogen
Hydrologic Unit	404.21	Source(s)	Nonpoint Sources
Total Waterbody Size	9.9	TMDL Priority	50
Size Affected	9.9	TMDL Start Date (Mo/Yr)	1999
Extent of Impairment	Malibu Creek to Malibu Lagoon	TMDL End Date (Mo/Yr)	2002

Watershed Characteristics

The Malibu Creek watershed is located about 35 miles west of Los Angeles, California. The watershed extends from the Santa Monica Mountains and adjacent Simi Hills to the Pacific coast at Santa Monica Bay, and drains an area of 109 square miles (Figure 3). The outlet of the watershed is Malibu Lagoon in the city of Malibu. Outflows from the watershed drain into Santa Monica Bay at Malibu Beach when the entrance to the lagoon is open to the ocean. However, coastal sediment transport processes typically form a sand barrier that blocks the entrance during the dry season. Malibu Lagoon accumulates all the watershed flows during these closed periods. Several creeks and lakes occur in the upper portions of the watershed, and these ultimately drain into Malibu Creek, which is the main stream in the downstream portion of the watershed. Malibu Creek drains into Malibu Lagoon.

Water Quality Objectives Not Attained

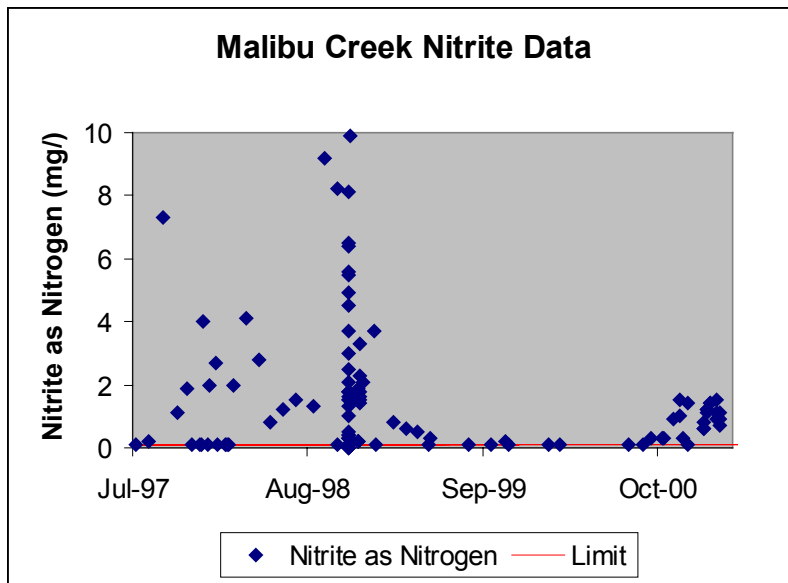
The Water Quality Control Plan for the Los Angeles Region (Basin Plan) states, "waters shall not exceed...1 mg/l as nitrite-nitrogen (NO₂-N)." This criterion range was exceeded in 67% of the water quality samples.

Beneficial Uses Affected

- Municipal and Domestic Supply

Data Assessment

The chart below shows that during 1997-2001 nitrite as nitrogen was exceeded in 85 samples.



Summary Table for Nitrite as Nitrogen

	Nitrite as Nitrogen (mg/l)
Dates of Sampling	11/10/97- 11/10/99
Number of Samples (n)	127
Minimum Data Value	0
Maximum Data Value	9.9
Median Data Value	0.6
Arithmetic Mean Value	1.41
Standard Deviation	2.0
Percent of samples above Limit	67

Potential Sources

The sampling location for the nitrite as nitrogen data was at various monitoring stations within the creek. Point and nonpoint discharge sources discharge into the creek watershed, such as septic systems, storm drains, and a wastewater treatment plant.

References

- Basin Plan, 1994
- Watershed Management Initiative, 2000
- Los Angeles County 1994-2000 Integrated Receiving Water Impacts Report, July 2000

California Regional Water Quality Control Board, Los Angeles Region

**Malibu Creek Watershed
Sedimentation**

Summary of Proposed Action

Malibu Creek Watershed, including Malibu Creek, Las Virgenes Creek, Triunfo Creek and Medea Creek, is proposed to be listed in the 2002 305(b) water quality assessment as “Partially Supporting (Impaired)” due to excessive sedimentation.

Table 1. 303(d) Listing/TMDL Information

Waterbody Name	Malibu Creek Watershed	Pollutants/Stressors	Sediment
Hydrologic Unit	404.21-404.25	Source(s)	Unknown
Total Waterbody Size		TMDL Priority	Low
Size Affected	35.46 miles	TMDL Start Date (Mo/Yr)	2012
Extent of Impairment	Malibu Creek, Las Virgenes Creek, Triunfo Creek and Medea Creek	TMDL End Date (Mo/Yr)	2014

Watershed Characteristics

The Malibu Creek watershed is located about 35 miles west of Los Angeles, California. The watershed extends from the Santa Monica Mountains and adjacent Simi Hills to the Pacific coast at Santa Monica Bay, and drains an area of 109 square miles. The outlet of the watershed is Malibu Lagoon in the city of Malibu. Outflows from the watershed drain into Santa Monica Bay at Malibu Beach when the entrance to the lagoon is open to the ocean. However, coastal sediment transport processes typically form a sand barrier that blocks the entrance during the dry season. Malibu Lagoon accumulates all the watershed flows during these closed periods. Several creeks and lakes occur in the upper portions of the watershed, and these ultimately drain into Malibu Creek, which is the main stream in the downstream portion of the watershed. Malibu Creek drains into Malibu Lagoon.

Water Quality Objectives Not Attained

Page 3-16 of the Basin Plan states, “Surface waters carry various amounts of suspended and settleable materials from both natural and human sources. Suspended sediments limit the passage of sunlight into waters, which in turn inhibits the growth of aquatic plants. Excessive deposition of sediments can destroy spawning habitat, blanket benthic (bottom dwelling) organisms, and abrades the gills of larval fish.

Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.”

Beneficial Uses Affected

Aquatic Life (macroinvertebrates based on bioassessment and physical habitat data)

Data Assessment

Study results submitted by Heal the Bay and reviewed by the California Department of Fish and Game indicate that the Malibu Creek watershed, with the exception of Cold Creek, are impaired by sedimentation based on both the biological assessment of the macroinvertebrate stream community assemblage and the physical habitat data. The data set submitted by Heal the Bay was collected using the California Stream Bioassessment Procedure (CSBP), developed by the California Department of Fish and Game, to evaluate the benthic macroinvertebrate community of streams (Harrington 1996). The CSBP is a regional adaptation of the U.S. Environmental Protection Agency Rapid Bioassessment Protocols (Barbour et al. 1999) and is recognized by the EPA as California's standardized bioassessment procedure (Davis et al. 1996).

Regional Board staff, as well as James M. Harrington, Staff Environmental Scientist of California Department of Fish and Game, reviewed the data. A letter from Harrington dated December 6, 2001, states, "All of the monitoring sites within the Malibu Creek watershed (except for the upper reaches of Cold Creek) show typical signs of ecological impairment due primarily to sediment (and nutrient enrichment). Low physical habitat scores primarily reflect the influence of heavy sediments in causing reduced habitat availability and reduced habitat quality for macroinvertebrates. The dominant taxa in these sites are all sediment tolerant, rapid colonizers which are adapted to collecting organic matter and algae as a food source. The low diversity of substrates and simplicity of the physical environment are primarily responsible for the overall low bioassessment scores in this watershed. Aquatic organisms can respond as negatively to inorganic sediment as they do to other contaminants (Newcombe and MacDonald 1991). Healthy communities of benthic macroinvertebrates that depend on diverse substrate particle size, available interstitial spaces and a complex habitat can be significantly affected or eliminated by excessive sediment deposition (Waters 1995). Benthic macroinvertebrates can be killed directly by suffocation or affected indirectly through the loss of food sources and habitat (Johnson et al. 1993)." Harrington concludes that "it is my opinion that Malibu Creek is impaired by excessive sedimentation."

Potential Sources

Unknown

References

- Heal the Bay Bioassessment data from Spring and Fall 2000
- Harrington, James M., letter to Jonathon S. Bishop, December 6, 2001
- Measuring the Health of California Streams and Rivers: A Methods Manual for Water Resource Professionals, Citizen Monitors, and Natural Resources Students by Jim Harrington and Monique Born, 2nd Edition, Revision 4, 1999-2000
- Basin Plan (1994)